

# APPENDIX A4-C

## EXAMPLES FROM THE NATIONAL WATER-QUALITY ASSESSMENT PROGRAM RELATED TO PROTOCOLS FOR COLLECTING BLANK SAMPLES AT GROUND-WATER SAMPLING SITES

Modified from Koterba and others, 1995

**APPENDIX A4-C. —Table 1.** Example of procedure to estimate and collect field volumes of blank solutions

[Modified from Koterba and others, 1995 and based on protocols of the National Water-Quality Assessment Program. Updated information is available on the World Wide Web at the following URL: <http://www.wrva.res.usgs.gov/nawqa/OFR95-399.html>. DIW, District deionized water with specific electrical conductance less than 1.0 microsiemens per liter; VBW, volatiles-organic-grade blank water; PBW, pesticide-grade blank water; IBW, inorganic-grade blank water; DOC, dissolved (filtered) organic carbon; gal, gallons; L, liters; ≈, approximately; NWQL, National Water Quality Laboratory; QWSU, Quality of Water Service Unit (Ocala, Fla.); SC, NWQL analytical schedule; LC, NWQL analyte code]

<b>Assumptions:</b> Submersible pump was used to collect the ground-water samples. Equipment just used to collect ground-water samples has been decontaminated, and, except for the pump intake being in a standpipe, is set up on site in the same manner as it was for the collection of ground-water samples.			
<b>Blank-solution types and estimate of volumes required<sup>1</sup></b>			
<b>Field blank(s) desired</b>	<b>Required blank-solution type</b>	<b>Minimum volume in gal (L)</b>	<b>Comments</b>
VOCs and DOC <sup>1</sup> or pesticides and DOC	VBW PBW <sup>1</sup>	1.5 (≈6)	Waste 0.5 gal, then collect field blanks; can use DIW to force last of VBW (or PBW) through the system.
VOCs, DOC <sup>1</sup> and pesticides	VBW	2.0 (≈8)	Waste 0.5 gal, then collect field blanks; can use DIW to force last of VBW or PBW through the system.
Major ions and nutrients, or trace elements	IBW	1.0 (≈4)	Waste 0.5 gal, then collect field blanks; can use DIW to force last of the IBW needed through the system.
Major ions and nutrients and trace elements	IBW	1.5 (≈6)	Waste 0.5 gal, then collect field blanks; if necessary, use DIW to force last of the IBW needed through the system.
Combinations of the organics and inorganics above	VBW/PBW and IBW	1.5 to 2.0 (≈6 to ≈8)  1.0 to 1.5 (≈4 to ≈6)	Waste 0.5 gal of the VBW or PBW, then collect organic field blanks. Use IBW to push the VBW or PBW through the system. Waste 0.5 gal. of IBW, then collect inorganic field blanks, using DIW to push the IBW through the system.

<sup>1</sup>NWQL-PBW can not be used for VOC field blanks. Select VBW or PBW for DOC field blanks only after reviewing certification forms of the lot numbers available. A solution blank sample of water from the same lot of NWQL water is used for DOC field blank and poured directly into DOC 125-mL amber sample bottle. Record the lot number of the water used for the solution blank on the ASR form.

## APPENDIX A4-C.—Table 2. Example of procedure to collect blank samples with a submersible pump

[Modified from Koterba and others (1995). Updated information is available on the World Wide Web at the following URL: <http://www.rvares.er.usgs.gov/nawqa/OFR95-399.html>. DIW, deionized water; VBW, volatiles-grade blank water; PBW, pesticide-grade blank water; IBW, inorganic-grade blank water; VOC, volatile organic compound; QC, quality control]

General Field-Blank Collection Procedure <sup>1</sup>
<ol style="list-style-type: none"> <li>1. Divide field team duties . Three-person team recommended—two people collect samples in a manner similar to that used to collect ground-water samples; the third person adds blank water to standpipe and controls flow through system, as needed, to facilitate field blank collection.</li> <li>2. Check flow set-up—from standpipe to sample collection/processing chamber, ensure that adequate volumes of DIW and the required blank water are within easy reach of person stationed at standpipe and arranged in order of collection: VBW first, PBW next, IBW last.</li> <li>3. Set low flow rate—Once pumping is initiated, set flow (on basis of measurement at chamber outflow) to about 0.1 gal. (500 mL) per minute or less to avoid wasting blank water (150 mL/min or less is recommended for filling VOC vials).</li> <li>4. Collect blank solutions in prescribed sequence—As solutions are changed, pump operator should change to clean gloves, empty residual solution from standpipe, rinse pump intake and standpipe, individually, at least three times each, with the next solution. Attempt to pump air segment into pump line before adding next solution to standpipe to mark change in solution type. <ul style="list-style-type: none"> <li>• If air segment can not be used to mark the end of one solution and the beginning of the next, then determine the change in solutions on the basis of the storage volume in line divided by the pumping rate to estimate the time it takes for the solution to travel from the standpipe to the collection/processing chamber.</li> <li>• Pass about 0.5 gallons (approximately 2 L) of blank solution to waste before collecting the QC sample, regardless of whether air segments or timed flow or both are used to assess when the solution arrives at the collection chamber.</li> <li>• Use one type of water to force the last of another type from the sample tubing after all samples that require that blank-water type have been collected, in order to limit the amount of blank water left in the sample tubing.</li> </ul> </li> </ol>

<sup>1</sup>**Assumptions:** Submersible pump was used to collect the ground-water samples. Organic and inorganic field blanks will be collected. Equipment just used to collect ground-water samples has been cleaned, and, except for the pump intake being in a standpipe instead of a well, is set up on site in the same manner as it was for the collection of ground-water samples. Standpipe has just been cleaned and subsequently rinsed with VBW. If only inorganic field blanks will be collected, rinse the cleaned standpipe with IBW and modify steps 2-4 accordingly.